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Does the addition of standard systematic biopsies to targeted prostate biopsies influence treatment choices for patients and clinicians?

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Introduction and Objectives

Multi-parametric MRI (mp-MRI) rather than trans-rectal ultrasound (TRUS)-guided prostate biopsy is becoming more popular as the initial evaluation of a patient with an elevated PSA or an abnormal prostate exam. If a cancer suspicious region (CSR) is detected by mp-MRI, the patient may undergo imaging-guided targeted biopsy with or without a standard systematic biopsy. Recently, there has been an increasing trend for patients to undergo focal treatment for focal tumors to avoid potential complications of surgery or radiation therapy. The question is whether targeted biopsy alone is sufficient to determine if the patient's tumor is focal. The objectives of this study are to determine the detection rate of prostate cancer (PCa) Gleason score (GS) ≥ 7 in the opposite side of the prostate from the CSRs and to determine if it is necessary to perform a standard systematic prostate biopsy in addition to a target biopsy.

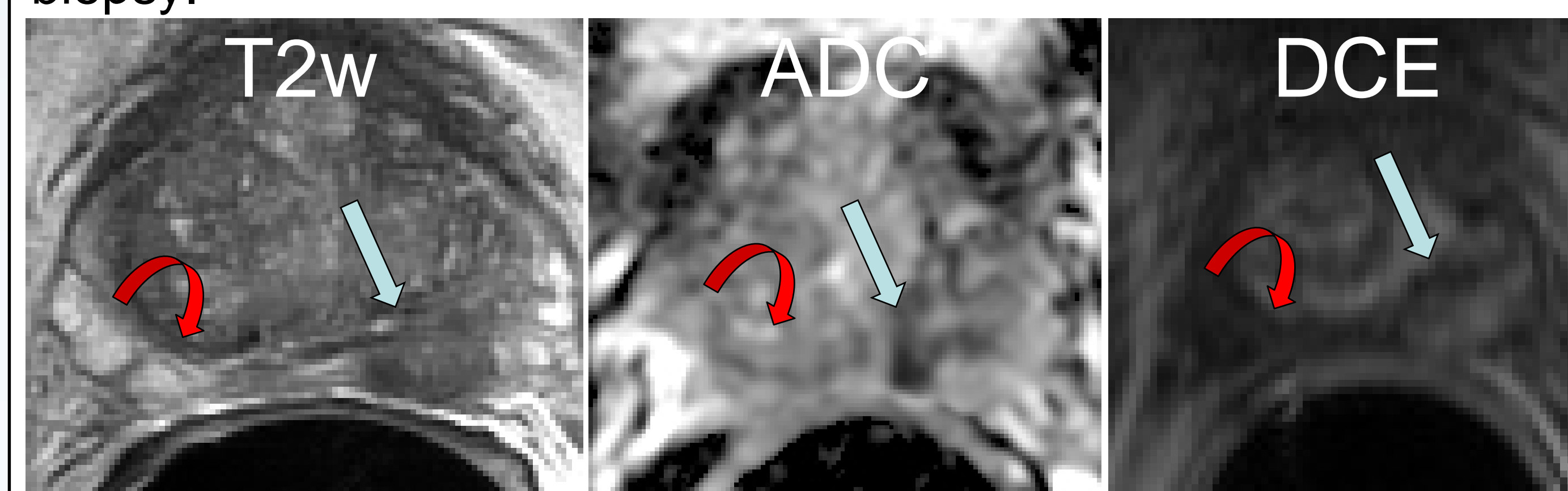
Materials and Methods

Sixty-eight consecutive men with elevated PSA, at least one CSR detected on mp-MRI on a single side of the prostate (right or left, not both) and no TRUS-guided biopsy within the preceding 3 years underwent MRI/US fusion-guided biopsy of CSRs and standard systematic prostate biopsy (12 cores). Histopathology results, including GS, location of cancer and percentage of tumor involving positive cores, as well as patients' clinical information, including age, PSA, PSA density and prostate volume, were recorded. Two experienced GU radiologists retrospectively reviewed all mp-MRI studies blindly. The assessment included but was not limited to location and PI-RADS scores of CSRs. The findings from the imaging review were correlated with the histopathology results. Statistical significance of differences in clinical information between patients with positive and negative biopsies on the opposite side from the target lesion was evaluated using Student's T-test.

Results

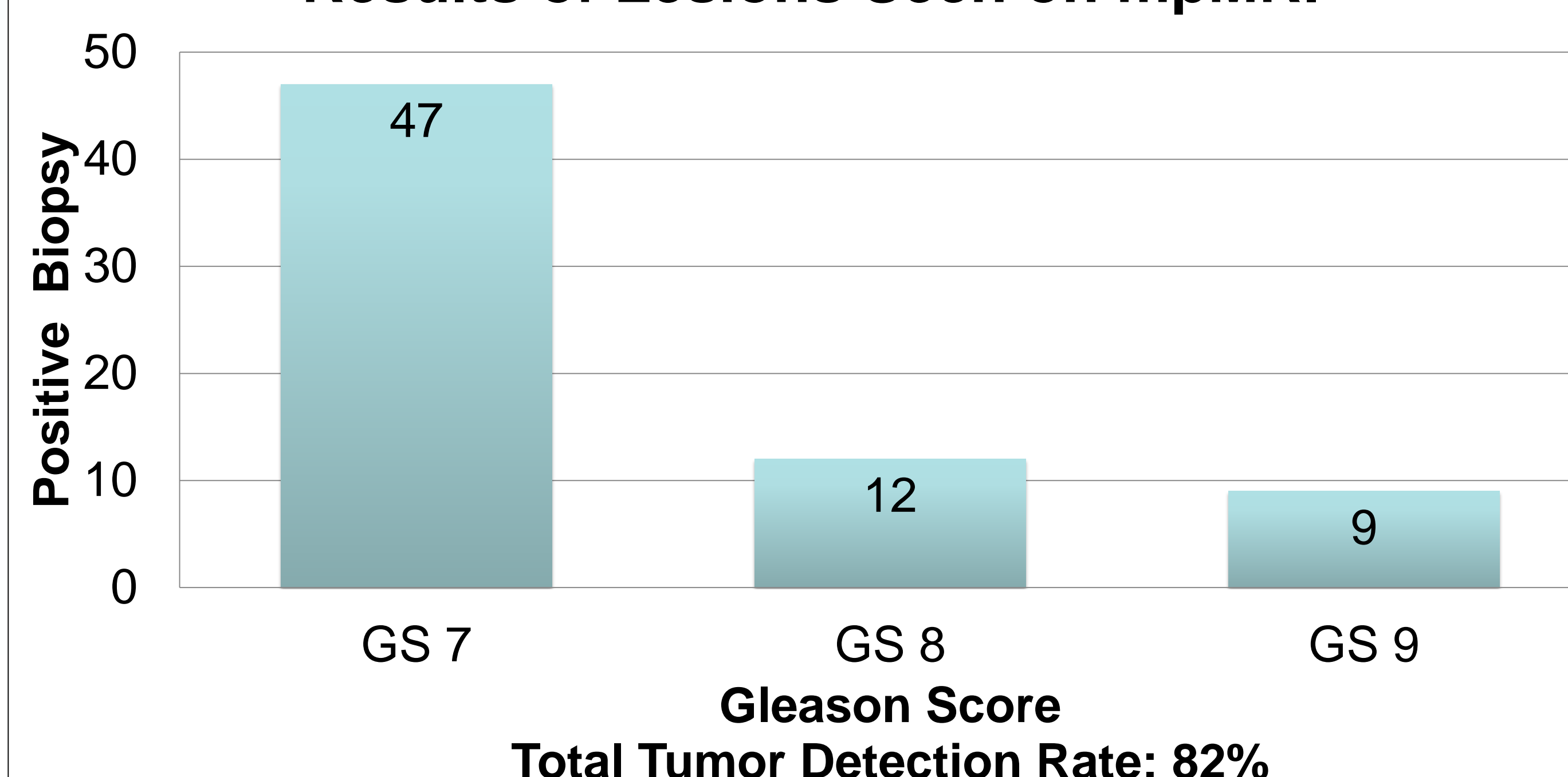
On confirmatory MRI/US fusion-guided targeted biopsy, 56 of 68 patients had biopsy-proven PCa (82%). Among them, 47 patients had PCa GS 7 (69%), 12 had PCa GS 8 (18%) and 9 had GS 9 (13%). Nine of 68 patients (13%) had PCa GS ≥ 7 on the opposite side of the prostate from the target lesions (GS 7, n=5 and GS 8, n=4) detected by the standard systematic biopsy. The mean percentage of the positive core of PCa for GS 7 was 40% and for GS 8 was 25%. Retrospective review of these patients' mp-MRI studies detected corresponding CSRs with PI-RADS score 3 on the opposite side from the target lesions in 3 of 9 patients. There was no statistically significant difference in patients' age, PSA, PSA density and prostate volume between patients with or without PCa GS ≥ 7 on one side (n=57) or both sides (n=9) of the prostate.

Standard systematic biopsies **should be added to** US/MRI fusion prostate biopsies in patients with no prior or ≥ 3 years prior TRUS biopsy.

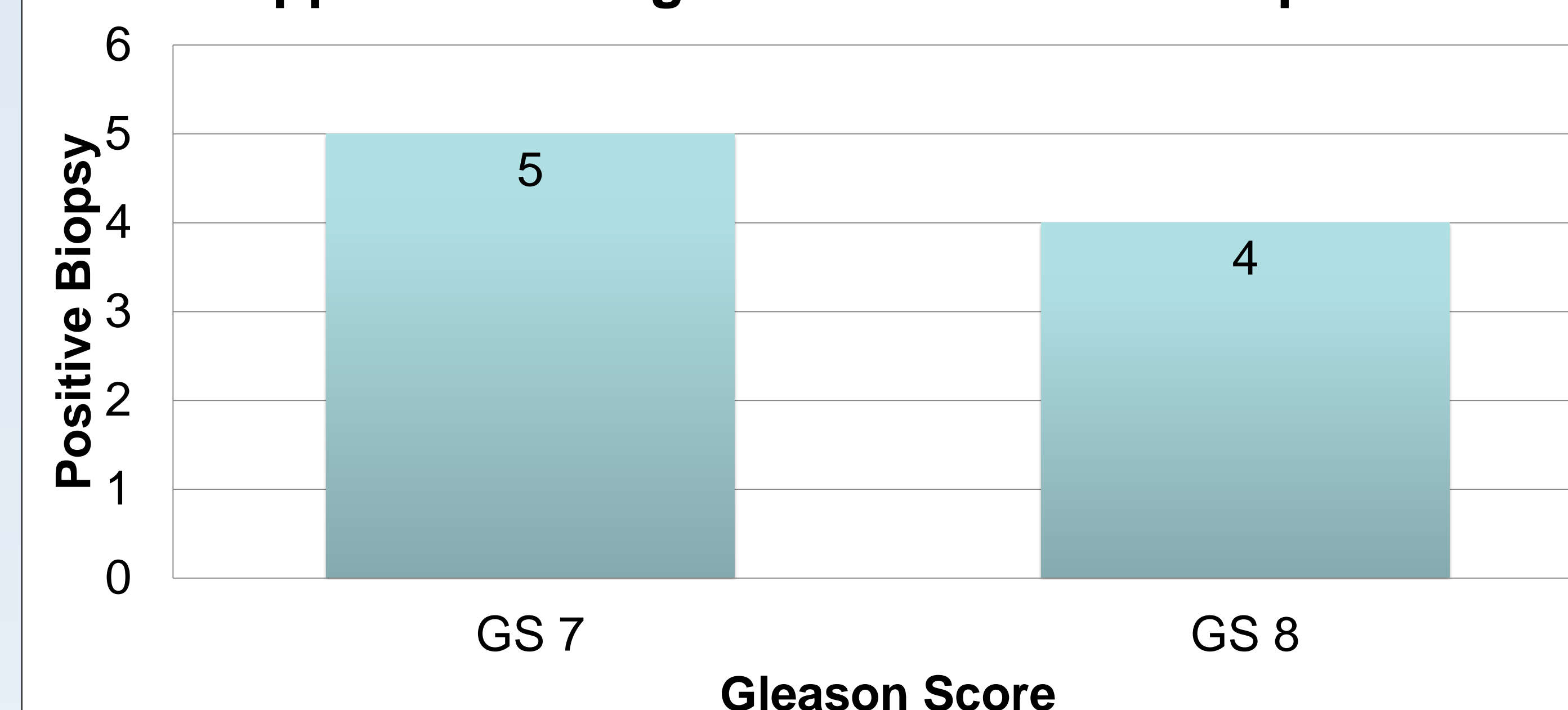


Straight arrow: Lesion readily visualized on mpMRI. Targeted biopsy confirmed PCa GS 7 (4+3), 60% in Left Base. **Curved arrow:** Systematic TRUS biopsy picks up PCa GS 7 (4+3), 20% in Right Base without evidence on mpMRI

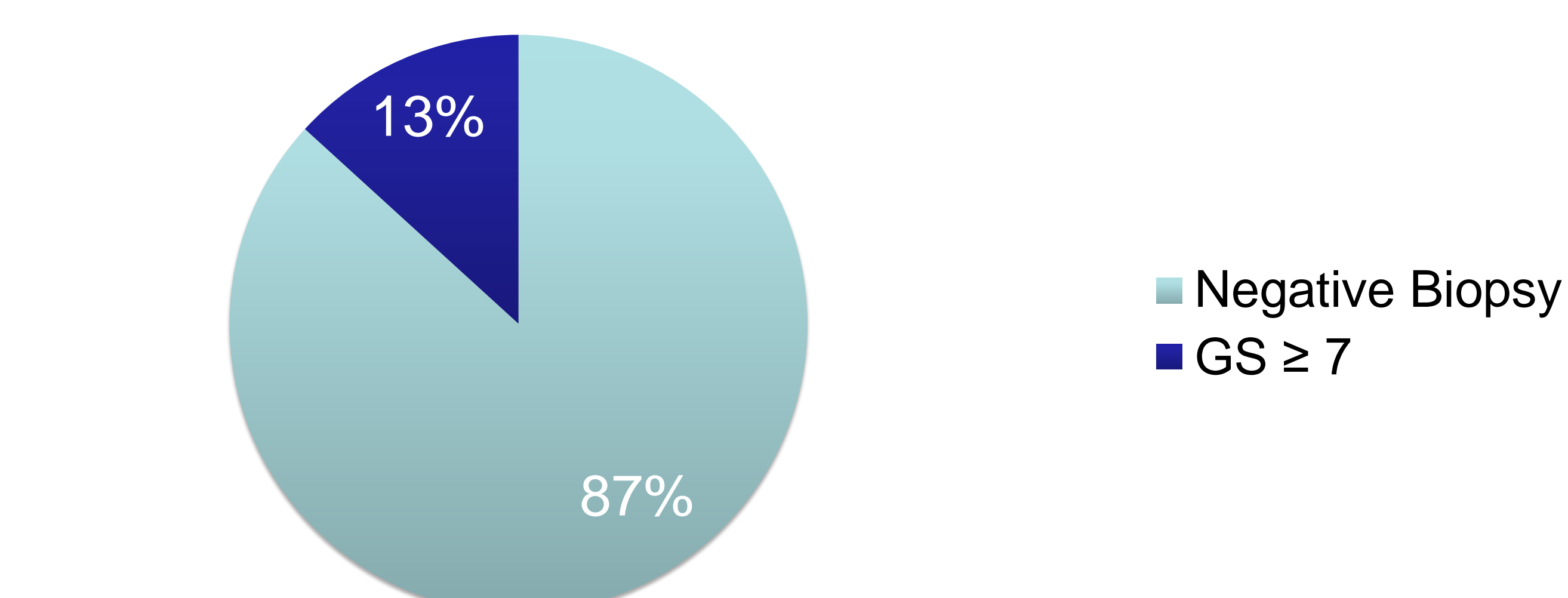
MRI/US Fusion-Guided Targeted Biopsy Results of Lesions Seen on mpMRI



Standard Systemic Prostate Biopsy Results Opposite to Target Lesions Seen on mpMRI



TRUS Biopsy Results on Opposite Side of Prostate (from the Target Lesion) which Showed No Lesion on mpMRI



Conclusions

Addition of standard systematic prostate biopsy to targeted biopsy in patients with elevated PSA and no prior systematic prostate biopsy within the preceding 3 years detected PCa GS ≥ 7 on the opposite side of the prostate from the target lesions (with no significant abnormalities on mp-MRI) in 13% of patients. This result may influence treatment choices, particularly for those patients considering focal therapy for PCa.

Acknowledgements

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